



Carmel Consolidated Comprehensive Plan



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TRANSPORTATION PLAN INTRODUCTION

Part 4: Transportation Plan is inclusive of vehicular, bicycle, pedestrian, and mass transportation. The City of Carmel recognizes that improving and establishing multiple modes of transportation is essential to further its evolution to a world class city.

The *C3 Plan* is the first of its kind to be inclusive of all mainstream transportation modes. The City is making the conscious decision to emphasize alternative modes of transportation to complement traditional vehicular transportation. Alternative transportation is increasingly desirable because residents want bicycle and pedestrian connectivity (e.g. side paths) to local amenities, commuters want alternatives (e.g. light rail) for travel to work, and life-style changes are demanding more recreational facilities (e.g. Monon Trail).

To address each mode of transportation, this Part is divided into the following three sections:

- | | |
|--|-------|
| 1. <i>Thoroughfare Plan</i> | pg 45 |
| 2. <i>Bicycle and Pedestrian Facility Plan</i> | pg 61 |
| 3. <i>Transit Plan</i> | pg 73 |

Thoroughfare Plan

Generally, the Thoroughfare Plan identifies and describes the recognized street classifications. It also includes the 20-Year Thoroughfare Plan Map which applies those street classifications to every street in Carmel's planning jurisdiction. The application of street classifications is designed to result in the effective connectivity and efficient flow of traffic.

Bicycle and Pedestrian Facility Plan

Generally, the Bicycle and Pedestrian Facility Plan identifies and describes the facilities designed for bicycle and pedestrian use. It also includes the Bicycle and Pedestrian Facility Plan Map which denotes where each type of facility is intended to be installed or maintained to achieve effective connectivity.

Transit Plan

Generally, the Transit Plan identifies and describes the transit system and facilities desired by Carmel. The transit system is currently in the planning stages, so the content of this Plan is meant to support the ongoing desire to establish a commuter line to downtown Indianapolis and intracity transportation.

THOROUGHFARE PLAN

The City's 20-Year Thoroughfare Plan focuses on facilities for motor vehicles, streets, and alternative transportation systems. The Thoroughfare Plan first identifies and describes recognized street classifications. It then applies those street classifications to every street in the City's planning jurisdiction on the Thoroughfare Plan Map.

Street Classifications and Descriptions

The following street classifications are used on the Thoroughfare Plan Map:

1. Residential Street - Lane	pg 46
2. Residential Street - Minor	pg 47
3. Residential Street - Major	pg 48
4. Collector Street	pg 49
5. Urban Collector Street	pg 50
6. Residential Parkway (2-lane)	pg 51
7. Residential Parkway (4-lane)	pg 52
8. Secondary Parkway	pg 53
9. Primary Parkway	pg 54
10. Urban Arterial	pg 55
11. Secondary Arterial	pg 56
12. Primary Arterial	pg 57

Each of the street classifications listed above has a page dedicated to describing how it can be used to convey vehicular traffic and how it fits into the fabric of the City. Further, the following headings are used, as described below, to convey the essence of each street classification:

General Description: This section gives a brief description of why the street classification has been established.

Street Features: This section conveys the primary design standards that make each street classification unique. The standards include: right-of-way, maximum number of lanes, minimum lane width, curbs, sidewalks and paths, on-street parking, street trees, and buffer plantings.

Typical Cross Section: This section references a typical cross section illustration of the street classification. The illustration is intended to portray the purest applied version of the street. When applied in the real world, variations in the design maybe necessary.

Design Priorities: During the design phase of all street improvement projects, decisions have to be made to best meet budgetary constraints, timelines, funding cycles, physical constraints, and political constraints. This section communicates the primary and secondary priorities for each street classification. Primary priorities are those that should not be foregone in design decisions. Secondary priorities are those that may be considered for compromise, non-inclusion, or later phases of the project.

Traffic Management Options: This section describes vehicular traffic management options to consider when improving a street. The options listed are intended to identify the most appropriate means to intersect streets, slow traffic (if appropriate), increase traffic efficiency (when appropriate), and improve safety.

RESIDENTIAL STREET - LANE

General Description

A Residential Street - Lane is designed primarily to provide access to platted residential lots and remote properties. These streets generally connect with Collector Streets and other Residential Streets. Residential Streets may include non-through streets.

Street Features

- **Minimum Right-of-Way:** 40 feet
- **Maximum Number of Lanes:** 2 lanes
- **Minimum Lane Widths:** 10 feet
- **Curbs:** Not required
- **Sidewalks and Paths:** Required as per the Bicycle and Pedestrian Facility Plan
- **On-Street Parking:** Not permitted
- **Minimum Tree Plot:** 3 feet
- **Street Trees:** Required
- **Buffer Planting:** Not required

Typical Cross Section

See illustration below

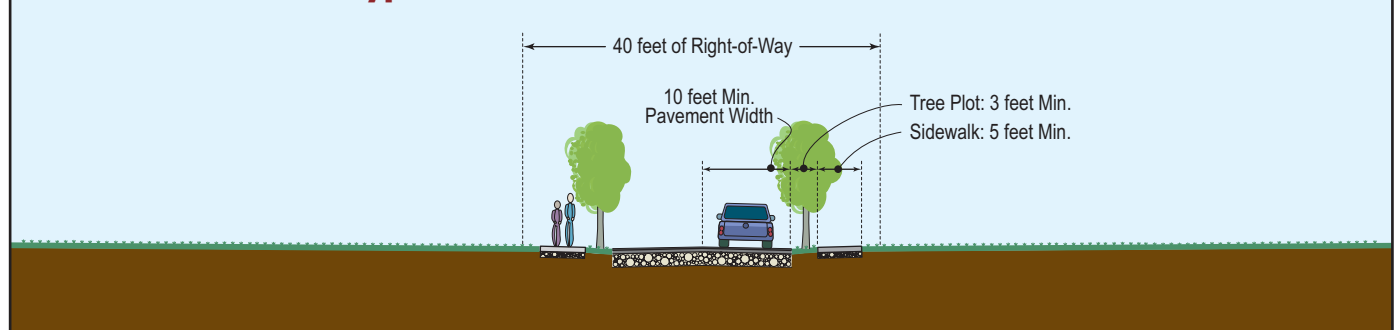
Design Priorities

- **Primary Priorities:**
 - Access to residential properties
 - Reinforcing neighborhood character
 - Connect bicycle and pedestrian facilities from cul-de-sacs
 - Properly installed and designed pedestrian facilities
- **Secondary Priorities:**
 - Width of travel lanes

Traffic Management Options

- Roundabouts
- Narrower lane widths

Local Street - Lane Typical Cross Section



RESIDENTIAL STREET - MINOR

General Description

A Residential Street is designed primarily to provide access to platted residential lots and remote properties. These streets generally connect with Collector Streets and other Residential Streets. Residential Streets may include non-through streets.

Street Features

- **Minimum Right-of-Way:** 50 feet
- **Maximum Number of Lanes:** 2 lanes
- **Minimum Lane Widths:** 11 feet
- **Curbs:** Required
- **Sidewalks and Paths:** Required as per the Bicycle and Pedestrian Facility Plan
- **On-Street Parking:** Optional on one side; 7 feet each
- **Minimum Tree Plot:** 3 feet
- **Street Trees:** Required
- **Buffer Planting:** Not required

Typical Cross Section

See illustration below

Design Priorities

- **Primary Priorities:**
 - Access to residential properties
 - Reinforcing neighborhood character
 - Connect bicycle and pedestrian facilities from cul-de-sacs
 - Properly installed and designed pedestrian facilities
- **Secondary Priorities:**
 - Width of travel lanes
 - On-street parking

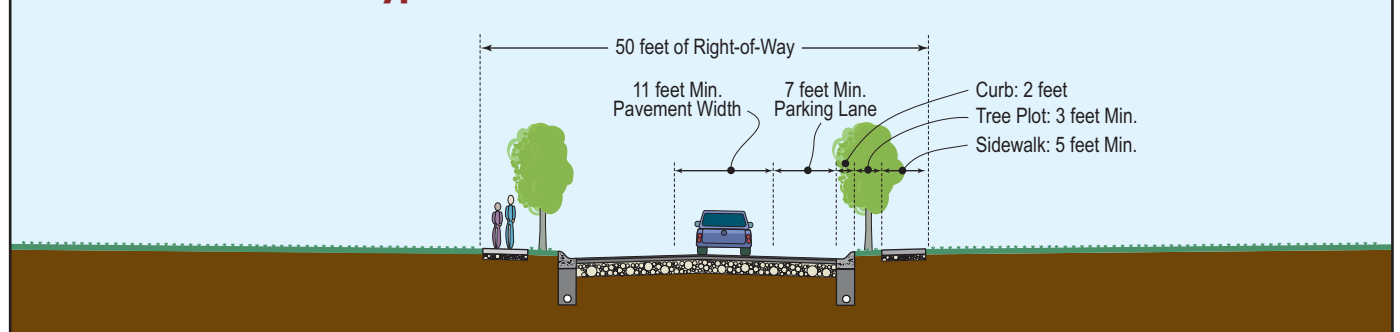
Traffic Management Options

- Roundabouts
- On-street parking
- Narrower lane widths



Hamilton Lane is an existing Residential Street with curbs, gutters, and sidewalks on both sides of the street.

Local Street - Minor Typical Cross Section



RESIDENTIAL STREET - MAJOR

General Description

A Residential Street is designed primarily to provide access to platted residential lots and remote properties. These streets generally connect with Collector Streets and other Residential Streets. Residential Streets may include non-through streets.

Street Features

- **Minimum Right-of-Way:** 55 feet
- **Maximum Number of Lanes:** 2 lanes
- **Minimum Lane Widths:** 11 feet
- **Curbs:** Required
- **Sidewalks and Paths:** Required as per the Bicycle and Pedestrian Facility Plan
- **On-Street Parking:** Optional on one side; 7 feet each
- **Minimum Tree Plot:** 5 feet
- **Street Trees:** Required
- **Buffer Planting:** Not Required

Typical Cross Section

See illustration below

Design Priorities

- **Primary Priorities:**
 - Access to residential properties
 - Reinforcing neighborhood character
 - Connect bicycle and pedestrian facilities from cul-de-sacs
 - Properly installed and designed pedestrian facilities
- **Secondary Priorities:**
 - Width of travel lanes
 - On-street parking

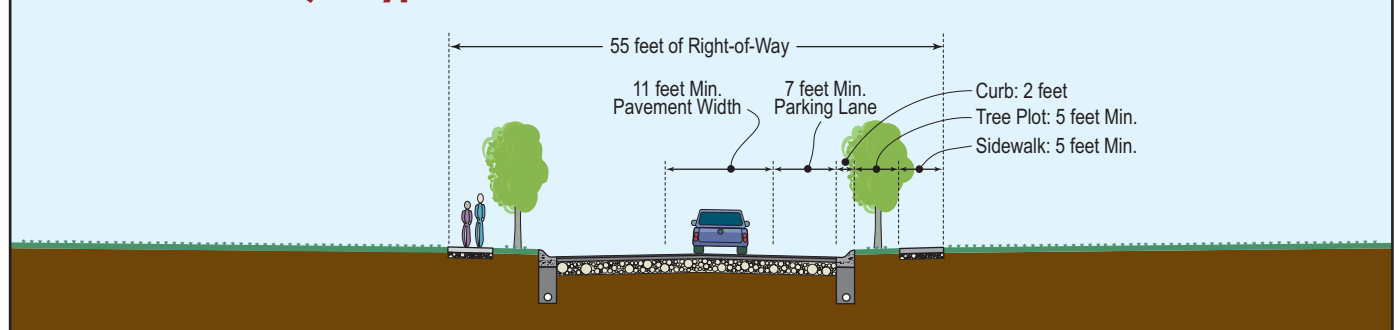
Traffic Management Options

- Roundabouts
- On-street parking
- Narrower lane widths
- Signs



Hamilton Lane is an existing Residential Street with curbs, gutters, and sidewalks on both sides of the street.

Local Street - Major Typical Cross Section



COLLECTOR STREET

General Description

A Collector Street is designed to allow direct residential driveway access and allow on-street parking when deemed safe. These streets primarily connect Residential Streets with Residential Parkways, Secondary Parkways, and Secondary Arterials.

Street Features

- **Minimum Right-of-Way:** 90 feet
- **Maximum Number of Lanes:** 4 lanes
- **Minimum Lane Width:** 11 feet
- **Curbs:** Required
- **Sidewalks and Paths:** Required as per the Bicycle and Pedestrian Facility Plan
- **On-Street Parking:** Optional on one or two sides; 7 feet each
- **Minimum Tree Plot:** 6 feet
- **Street Trees:** Required
- **Buffer Planting:** Required

Typical Cross Section

See illustration below

Primary Priorities Within Right-of-Way

- Neighborhood character
- **Bicycle and** pedestrian facilities
- Street trees

Secondary Priorities Within Right-of-Way

- Width of travel lanes
- On-street parking

Traffic Management Features

- Roundabouts
- On-street parking
- Narrower lane widths
- Curb extensions at traditional intersections (bump-outs)
- **Bicycle lanes**
- **Signs**

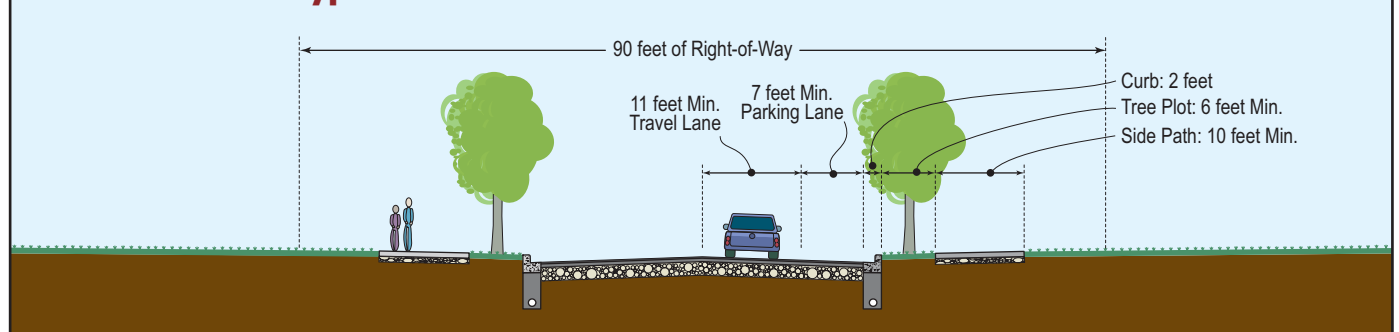


North Range Line Road is a unique Collector Street serving residential-scale businesses.



Segments of Spring Mill Road currently serve as a Collector Street, but does not reflect the desired cross section; inclusion of side paths.

Collector Street Typical Cross Section



URBAN COLLECTOR STREET

General Description

An Urban Collector Street is designed to allow direct residential driveway access and allow on-street parking when deemed safe in urban areas. These streets primarily connect Residential Streets with Residential Parkways, Secondary Parkways, Urban Arterials, Secondary Arterials and other Urban Collector Streets.

Street Features

- **Minimum Right-of-Way:** 65 66 feet
- **Maximum Number of Lanes:** 4 lanes
- **Minimum Lane Width:** 11 feet
- **Curbs:** Required
- **Sidewalks and Paths:** Required as per the Bicycle and Pedestrian Facility Plan
- **On-Street Parking:** Optional on one or two sides; 8 7 feet each
- **Minimum Tree Plot:** N/A
- **Street Trees:** Required
- **Buffer Planting:** Tree grates

Typical Cross Section

See illustration below

Primary Priorities Within Right-of-Way

- Bicycle and pedestrian facilities
- Width of travel lanes
- Sensitive to context
- On-street parking
- Bicycle lanes

Secondary Priorities Within Right-of-Way

- Street trees
- On-street parking

Traffic Management Features

- Roundabouts
- On-street parking
- Narrower lane widths
- Curb extensions at traditional intersections (bump-outs)
- Bicycle lanes
- Signs

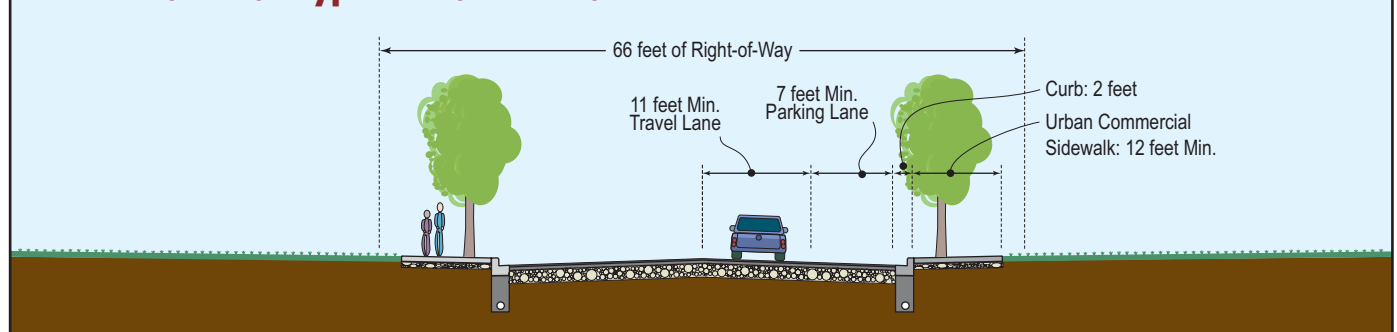


West Main Street in Carmel's original business district, offers on-street parking and wide sidewalks.



Redevelopment in Old Town has increased the use of on-street parking. Street trees are added to the streetscape to enhance pedestrian comfort.

Urban Collector Typical Cross Section



RESIDENTIAL PARKWAY 2-LANE

General Description

A Residential Parkway (2-lane) is designed to maintain residential character and to efficiently convey residential traffic to more major roads. Driveway access should be reduced when possible and on-street parking can be permitted when deemed safe. Residential Parkways (2-lane) primarily connect Residential Streets with Collector Streets, Secondary Parkways, Primary Parkways, Secondary Arterials and other Residential Parkways.

Street Features

- **Minimum Right-of-Way:** 120 feet
- **Maximum Number of Lanes:** 2 lanes
- **Minimum Lane Width:** 11 feet
- **Curbs:** Required
- **Sidewalks and Paths:** Required as per the Bicycle and Pedestrian Facility Plan
- **On-Street Parking:** Optional on one or two sides; 8' 7" feet each
- **Minimum Tree Plot:** 6 feet
- **Street Trees:** Required
- **Buffer Planting:** Required

Typical Cross Section

See illustration below

Primary Priorities Within Right-of-Way

- Neighborhood character
- Sensitive to context
- **Bicycle and** pedestrian facilities
- Width of tree plots
- Median planting
- Street trees

Secondary Priorities Within Right-of-Way

- Width of travel lanes
- On-street parking
- Bicycle lanes

Traffic Management Features

- Roundabouts
- On-street parking
- Narrower lane widths
- Curb extensions at traditional intersections (bump-outs)
- **Bicycle lanes**
- **Signs**

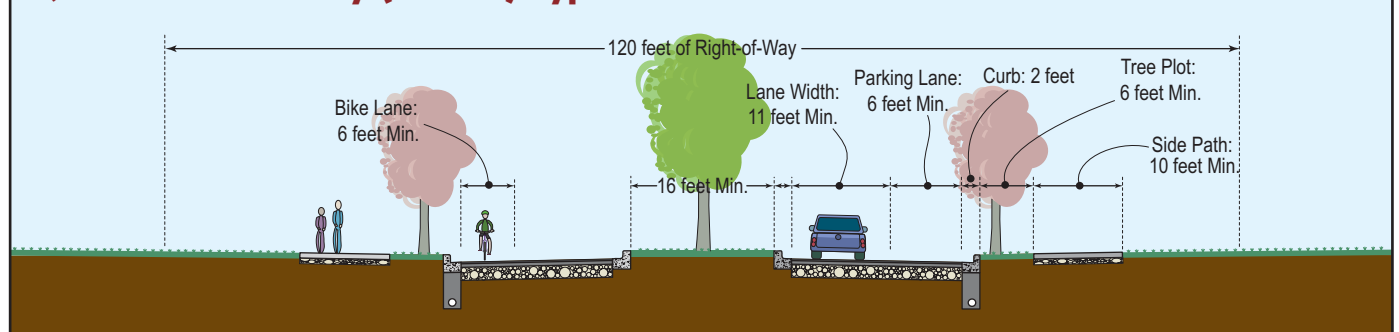


Recent improvements to Oak Ridge Road typify Residential Parkway design.



Millbrook Parkway provides the residents of Brooks Bend an attractive and safe connection to 99th Street.

Residential Parkway (2-Lane) Typical Cross Section



RESIDENTIAL PARKWAY 4-LANE

General Description

A Residential Parkway (4-lane) is designed to reflect residential character and to efficiently convey residential traffic to more major roads. Driveway access should be minimized and on-street parking can be permitted when deemed safe. Residential Parkways (4-lane) primarily connect Residential Streets with Collector Streets, Secondary Parkways, Primary Parkways, Secondary Arterials and other Residential Parkways.

Street Features

- **Minimum Right-of-Way:** 120 feet
- **Maximum Number of Lanes:** 4 lanes
- **Minimum Lane Width:** 11 feet
- **Curbs:** Required
- **Sidewalks and Paths:** Required as per the Bicycle and Pedestrian Facility Plan
- **On-Street Parking:** Optional on one or two sides; 8' 7" each
- **Minimum Tree Plot:** 6 feet
- **Street Trees:** Required
- **Buffer Planting:** Required

Typical Cross Section

See illustration below

Primary Priorities Within Right-of-Way

- Sensitive to context
- Width of travel lanes
- **Bicycle and** pedestrian facilities
- Median planting
- Street trees

Secondary Priorities Within Right-of-Way

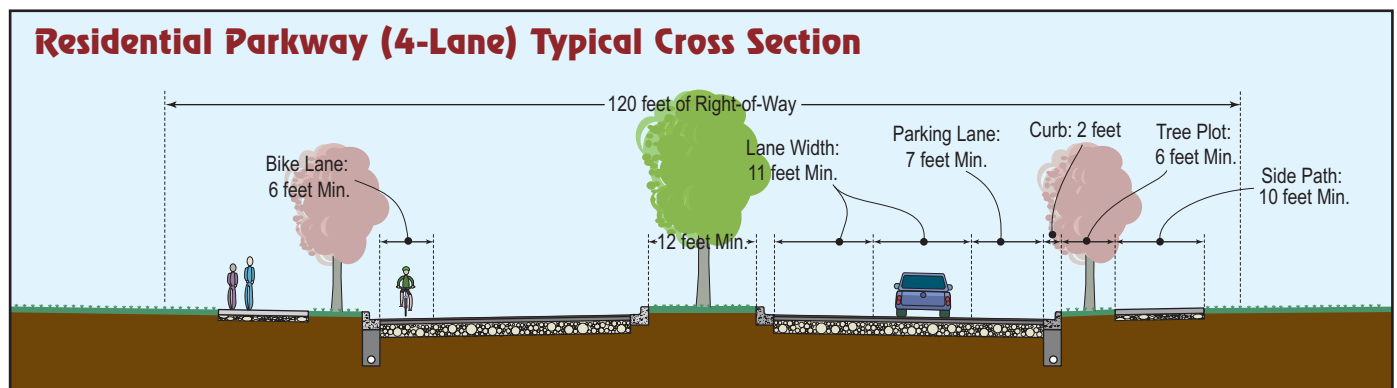
- Neighborhood character
- Bicycle lanes
- Width of tree plots
- On-street parking

Traffic Management Features

- Roundabouts
- On-street parking
- Defined turn lanes at intersections or roundabouts
- Narrower lane widths
- Curb extensions at traditional intersections (bump-outs)
- **Bicycle lanes**
- **Signs**



Hazel Dell Parkway provides access to residential, commercial, recreational and institutional uses as it traverses East Carmel from north to south.



SECONDARY PARKWAY

General Description

A Secondary Parkway is equivalent to a Secondary Arterial, but is configured with a median and more aesthetic characteristics. Secondary Parkways primarily connect Collector Streets, Residential Parkways, Secondary Parkways, and Secondary Arterials with Primary Parkways and Primary Arterials.

Street Features

- **Minimum Right-of-Way:** 130 feet
- **Maximum Number of Lanes:** 4 lanes
- **Minimum Lane Width:** ~~12~~ 11 feet
- **Curbs:** Required
- **Sidewalks and Paths:** Required as per the Bicycle and Pedestrian Facility Plan
- **On-Street Parking:** Not Permitted
- **Minimum Tree Plot:** 6 feet
- **Street Trees:** Required
- **Buffer Planting:** Required

Typical Cross Section

See illustration below

Primary Priorities Within Right-of-Way

- Sensitive to context
- Width of travel lanes
- **Bicycle** and pedestrian facilities
- Median planting
- Street trees

Secondary Priorities Within Right-of-Way

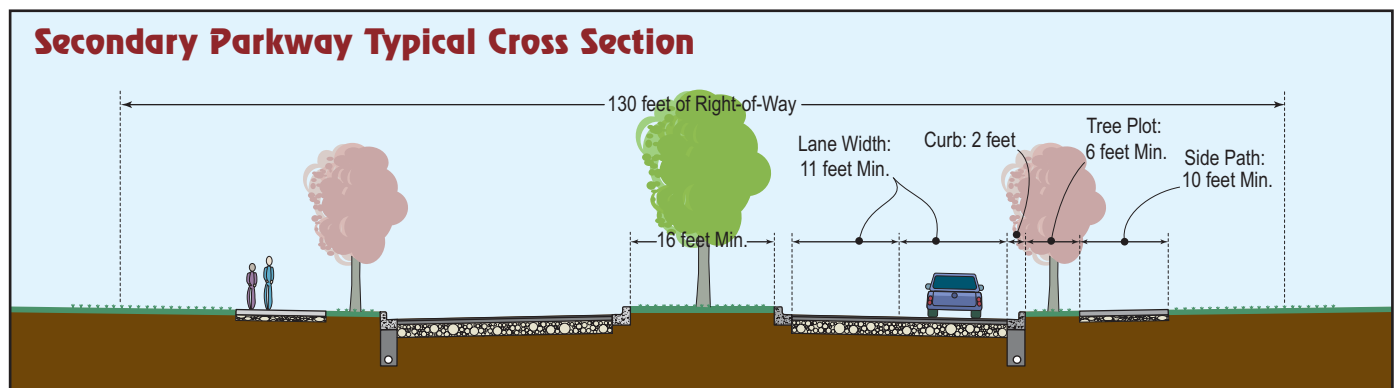
- Bicycle lanes
- Tree plot widths

Traffic Management Features

- Roundabouts
- Defined turn lanes at intersections or roundabouts
- Acceleration and deceleration lanes
- Limited median interruption
- **Bicycle lanes**
- **Signs**



A recently constructed segment of Illinois Street begins to establish the character of this Secondary Parkway.



PRIMARY PARKWAY

General Description

A Primary Parkway is equivalent to a Primary Arterial but is configured with a median and more aesthetic characteristics. Primary Parkways primarily connect Collector Streets, Residential Parkways, Secondary Parkways, and Secondary Arterials with Primary Parkways, Primary Arterials and Highways.

Street Features

- **Minimum Right-of-Way:** 140 feet
- **Maximum Number of Lanes:** 4 lanes
- **Minimum Lane Width:** ~~12~~ 11 feet
- **Curbs:** Required
- **Sidewalks and Paths:** Required as per the Bicycle and Pedestrian Facility Plan
- **On-Street Parking:** Not Permitted
- **Minimum Tree Plot:** 6 feet
- **Street Trees:** Required
- **Buffer Planting:** Required

Typical Cross Section

See illustration below

Primary Priorities Within Right-of-Way

- Sensitive to context
- Width of travel lanes
- **Bicycle** and pedestrian facilities
- Median planting
- Street trees

Secondary Priorities Within Right-of-Way

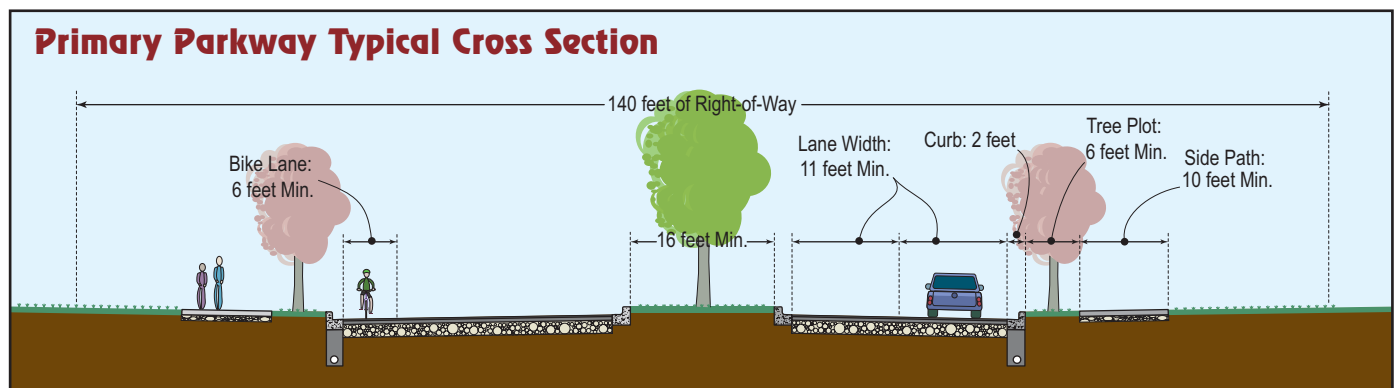
- Bicycle lanes
- Tree plot widths

Traffic Management Features

- Roundabouts
- Defined turn lanes at intersections or roundabouts
- Acceleration and deceleration lanes
- Limited median interruption
- Grade separation at Highways
- Exit ramps at Highways and Interstates
- **Bicycle lanes**
- **Signs**



Pennsylvania Street provides access to Regional Employment areas on the east side of U.S. 31.



URBAN ARTERIAL

General Description

An Urban Arterial is equivalent to a Secondary Arterial but is configured to fit within a developed corridor. Urban Arterials primarily connect Residential Streets, Collector Streets, Urban Collectors, Residential Parkways, and Secondary Arterials with Primary Parkways, Primary Arterials and Highways. An Urban Arterial is designed to allow limited driveway access and allow on-street parking when deemed safe in urban areas.

Street Features

- **Minimum Right-of-Way:** 90 feet
- **Maximum Number of Lanes:** 4 lanes
- **Minimum Lane Width:** ~~12~~ 11 feet
- **Curbs:** Required
- **Sidewalks and Paths:** Required as per the Bicycle and Pedestrian Facility Plan
- **On-Street Parking:** Optional on one or two sides; ~~8-5~~ 7 feet each
- **Minimum Tree Plot:** N/A
- **Street Trees:** Required
- **Buffer Planting:** Tree grates

Typical Cross Section

See illustration below

Primary Priorities Within Right-of-Way

- Width of travel lanes
- Sensitive to context
- Pedestrian facilities
- **Bicycle lanes**

Secondary Priorities Within Right-of-Way

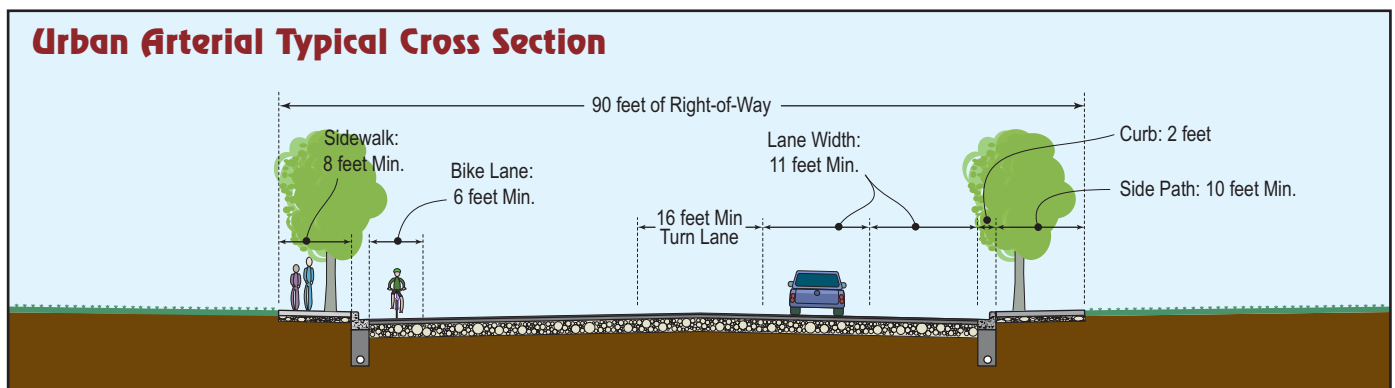
- Street trees in grates
- On-street parking

Traffic Management Features

- Roundabouts
- Defined turn lanes at intersections or roundabouts
- On-street parking
- Narrower lane widths
- Curb extensions at traditional intersections (bump-outs)
- **Bicycle lanes**
- **Signs**



South Range Line Road has reasserted itself as a significant commercial corridor providing the main point of entry into the Old Town Arts and Design District from the south.



SECONDARY ARTERIAL

General Description

A Secondary Arterial is designed to carry heavy volumes of traffic to major destinations in the City. Generally, Secondary Arterials are focused on mitigating traffic in narrow rights-of-way. Secondary Arterials primarily connect Collector Streets, Residential Parkways, Secondary Parkways, and Secondary Arterials with Primary Parkways, Primary Arterials and Highways.

Street Features

- **Minimum Right-of-Way:** 100 feet
- **Maximum Number of Lanes:** 4 lanes
- **Minimum Lane Width:** ~~12~~ 11 feet
- **Curbs:** Required
- **Sidewalks and Paths:** Required as per the Bicycle and Pedestrian Facility Plan
- **On-Street Parking:** Not Permitted
- **Minimum Tree Plot:** 8 feet
- **Street Trees:** Required
- **Buffer Planting:** Required

Typical Cross Section

See illustration below

Primary Priorities Within Right-of-Way

- Width of travel lanes
- **Bicycle** and pedestrian facilities

Secondary Priorities Within Right-of-Way

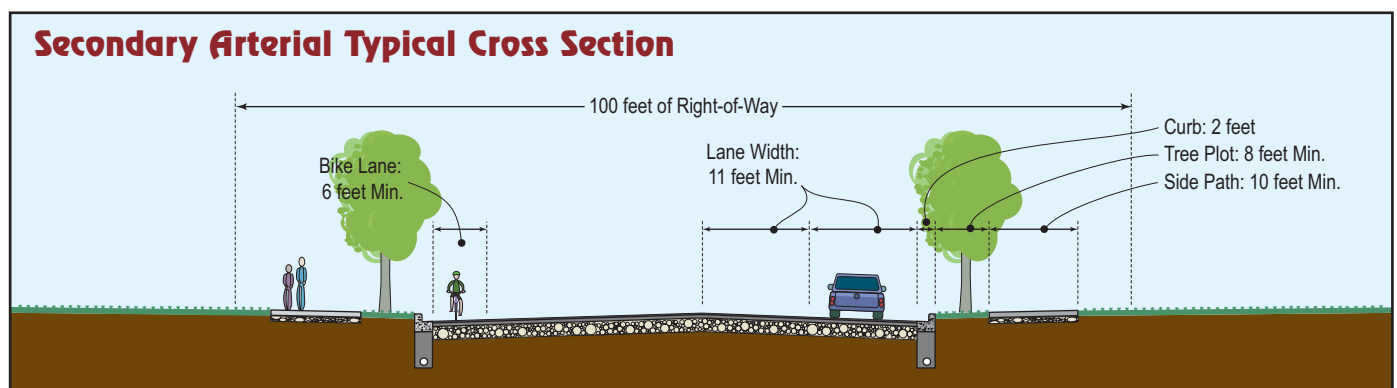
- Sensitive to context
- Street trees
- Bicycle lanes
- Tree plot widths

Traffic Management Features

- Roundabouts
- Defined turn lanes at intersections or roundabouts
- Acceleration and deceleration lanes
- Grade separation at Highways
- Exit ramps at Highways and Interstates
- **Bicycle lanes**
- **Signs**



East 116th Street east of Keystone Avenue provides off-street facilities for pedestrians and on-street facilities for cyclists and motorists.



PRIMARY ARTERIAL

General Description

A Primary Arterial is designed to carry very heavy volumes of traffic to major destinations in or out of the City. Generally, Primary Arterials are focused on mitigating heavy traffic in narrow rights-of-way. Primary Arterials primarily connect Residential Parkways, Secondary Parkways, and Secondary Arterials with Primary Parkways, Primary Arterials and Highways.

Street Features

- **Minimum Right-of-Way:** 150 feet
- **Maximum Number of Lanes:** 4 lanes
- **Minimum Lane Width:** ~~12~~ 11 feet
- **Curbs:** Required
- **Sidewalks and Paths:** Required as per the Bicycle and Pedestrian Facility Plan
- **On-Street Parking:** Not Permitted
- **Minimum Tree Plot:** 8 feet
- **Street Trees:** Required
- **Buffer Planting:** Required

Typical Cross Section

See illustration below

Primary Priorities Within Right-of-Way

- Width of travel lanes
- **Bicycle** and pedestrian facilities

Secondary Priorities Within Right-of-Way

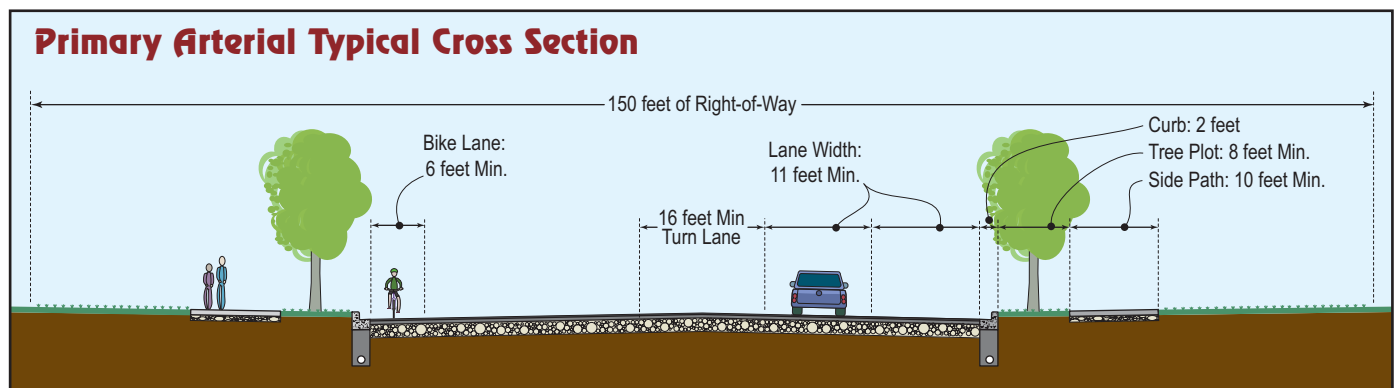
- Sensitive to context
- Street trees
- Bicycle lanes
- Tree plot widths

Traffic Management Features

- Roundabouts
- Defined turn lanes at intersections or roundabouts
- Acceleration and deceleration lanes
- Grade separation at Highways
- Exit ramps at Highways and Interstates
- **Bicycle lanes**
- **Signs**

A photo was unavailable at the time of publishing the first full draft to the C3 Plan. Insert Photo of 146th Street in Draft B.

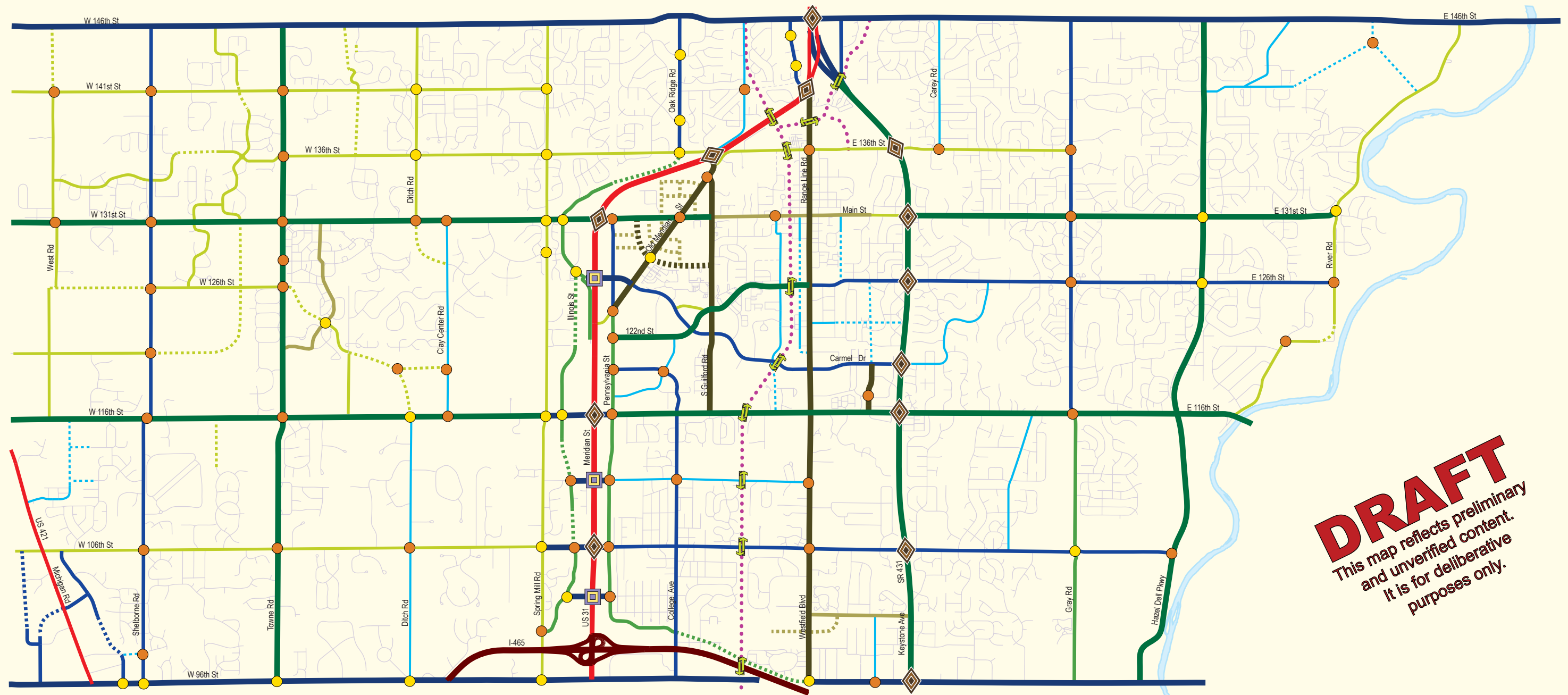
Insert photo of 146th Street east of U.S. 31.



THOROUGHFARE PLAN MAP

The Thoroughfare Plan Map (on the next page) applies a street classification to each street in Carmel's planning jurisdiction. The applied street classification represents what the street will evolve to be over the course of 20 years, not as it currently exists.

The Thoroughfare Plan Map also denotes where new streets are necessary to fulfill the *C3 Plan's* goals to mitigate traffic and ~~improve quality of life~~ promote ease of travel by all modes. These new streets should be viewed as mandatory when land is being developed adjacent to or inclusive of the new street's proposed location.

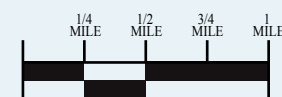


DRAFT
This map reflects preliminary
and unverified content.
It is for deliberative
purposes only.

MAP LEGEND

- | | | | |
|---------------------------|-------------------------------|--------------------------------|------------------------------------|
| Interstate | Secondary Arterial | Residential Parkway | Off-Street Commuter Trail |
| U.S./State Highway | Secondary Arterial (Proposed) | Residential Parkway (Proposed) | Grade-Separated Crossing |
| Primary Arterial | Secondary Parkway | Collector Street | Interchange Location |
| Primary Parkway | Secondary Parkway (Proposed) | Collector Street (New) | Overpass Location |
| Urban Arterial | Urban Collector | Residential Street | Roundabout Intersection (Existing) |
| Urban Arterial (Proposed) | Urban Collector (Proposed) | Residential Street (New) | Roundabout Intersection (Proposed) |
| | | River | |

THOROUGHFARE PLAN MAP



Map Prepared by Ground Rules, Inc.

Last Revised 08-10-2006

Back Side of Thoroughfare Plan Pull-Out

BICYCLE AND PEDESTRIAN FACILITY PLAN

The City's Bicycle and Pedestrian Facility Plan focuses on facilities for non-motorized transportation. One primary purpose for these facilities is to provide an alternative for people to get where they are going without using their vehicles. As a result, bicycle and pedestrian facilities help mitigate traffic throughout the City while improving the health of residents. Another primary purpose for bicycle and pedestrian facilities is to provide a means for people who cannot drive vehicles (e.g. youth, blind, and seniors) to safely get to local destinations.

The secondary purpose for bicycle and pedestrian facilities is fitness training and general recreation. People desirous of a healthy life-style tend to need facilities to safely walk, run, skate/blade, or cycle. The City of Carmel realizes not all **bicycle and** pedestrian facilities are designed for all types of fitness activities (e.g. fitness cycling is not appropriate on sidewalks or Side Paths). Therefore, multiple **bicycle and** pedestrian facilities may be necessary in the same right-of-way to accommodate different fitness activities.

Bicycle and Pedestrian Facility Classifications and Descriptions

The following bicycle and pedestrian facility classifications are used on the Bicycle and Pedestrian Facility Plan Map:

1. Residential Sidewalk	pg 62
2. Urban Residential Sidewalk	pg 63
3. Urban Commercial Sidewalk	pg 64
4. Side Path	pg 65
5. On-Street Bicycle Lane	pg 66
6. Off-Street Urban Trail	pg 67
7. Off-Street Trail	pg 68

Each of the bicycle and pedestrian facility classifications listed above has a page dedicated to describing how it can be used to convey bicycle and pedestrian traffic and how it fits into the fabric of the City. Further, the following headings are used, as described below, to convey the essence of each bicycle and pedestrian facility classification:

General Description: This section gives the reader a brief description of why the bicycle and pedestrian facility classification has been established.

Bicycle and Pedestrian Facility Features: This section conveys the primary design standards that make each bicycle and pedestrian facility classification unique. The standards include: right-of-way, minimum facility width, construction material, joints, obstructions, and street separation.

Typical Cross Section: This section references images of each bicycle and pedestrian facility classification. The images are intended to portray some of the best examples available in Carmel, but might not represent the purest intent of the facility. When applied in the real world, variations in the design may also be necessary.

Design Priorities: During the design phase of all bicycle and pedestrian facility improvement projects, decisions have to be made to best meet budgetary constraints, timelines, funding cycles, physical constraints, and political constraints. This section communicates the primary and secondary priorities for each bicycle and pedestrian facility classification. Primary priorities are those that should not be foregone in design decisions. Secondary priorities are those that maybe considered for compromise, non-inclusion, or later phases.

Safety Options-Enhancements: This section describes bicycle and pedestrian safety options to consider when installing or improving a facility. The **options-enhancements** listed are intended to identify the most appropriate for the subject facility.

RESIDENTIAL SIDEWALK

General Description

A Residential Sidewalk is designed to accommodate the following type of pedestrian activities in suburban neighborhoods:

- walking
- pushing strollers
- children's recreation

Generally, Residential Sidewalks provide connectivity from home to home and linkages to bicycle and pedestrian facilities along perimeter roads (e.g. Side Paths).

Facility Features

- **Right-of-Way:** Fully within a public right-of-way
- **Minimum Facility Width:** 5 feet
- **Construction Material:** Concrete
- **Joints:** Saw-cut preferred, tooled is permitted
- **Obstructions:** None allowed
- **Street Separation:** 6-foot tree plot is required

Typical Cross Section

See images in right column.

Design Priorities

- **Primary Priorities:**
 - Reinforcing neighborhood character
 - ADA compliance at intersections
 - Unobstructed
- **Secondary Priorities:**
 - Avoid steep slopes
 - Avoid unnecessary curvature of alignment

Safety Enhancements

- Striped crosswalks
- Change in pavement material at corners
- Saw-cut joints
- Tree canopy trimmed to give at least 7 feet of clearance
- Lighting



Sidewalks along Melark Drive in The Enclave of Carmel provide pedestrian access to neighboring Concord Village.



Care should be taken to avoid or remove obstructions to provide a safe pedestrian way.



Birchwood Court illustrates a proper relationship of street, planting strip, and sidewalk.

URBAN RESIDENTIAL SIDEWALK

General Description

An Urban Residential Sidewalk is designed to accommodate the following type of pedestrian activities in urban neighborhoods:

- walking
- pushing strollers
- children's recreation

Generally, Urban Residential Sidewalks provide connectivity from home to home and linkages to **bicycle and** pedestrian facilities along perimeter roads (e.g. Side Paths) or Urban Commercial Sidewalks.

This type of facility is not encouraged in new subdivisions or developments.

Facility Features

- **Right-of-Way:** Fully within a public right-of-way
- **Minimum Facility Width:** 6 feet
- **Construction Material:** Concrete, brick or hardscape pavers
- **Joints:** Not applicable, but saw-cut is preferred for concrete sidewalks
- **Obstructions:** Street lights, street signs, and trees may be located in the sidewalk as long as 5 feet of clear-way is maintained in all sections
- **Street Separation:** Not required

Typical Cross Section

See images in right column.

Design Priorities

- **Primary Priorities:**
 - Reinforcing neighborhood character
 - ADA compliance at intersections
 - Street trees
- **Secondary Priorities:**
 - Unobstructed
 - Avoid steep slopes
 - Avoid unnecessary curvature of alignment

Safety Enhancements

- Striped crosswalks
- Change in pavement material at corners
- Saw-cut joints
- Tree canopy trimmed to give at least 7 feet of clearance
- Lighting



Urban Residential Sidewalks are particularly suited to historic neighborhoods.



The Urban Residential Sidewalk on First Street NW in Old Town provides pedestrian access to Range Line Road.



High density developments like Brookshire Village make use of Urban Residential Sidewalks.

URBAN COMMERCIAL SIDEWALK

General Description

An Urban Commercial Sidewalk is designed to accommodate the following type of pedestrian activities in urban settings:

- walking
- sitting on benches
- outdoor dining
- pushing strollers

Generally, Urban Commercial Sidewalks provide connectivity from business to business and linkages to other pedestrian facilities along perimeter roads (e.g. Side Paths) or Urban Residential Sidewalks.

Facility Features

- **Right-of-Way:** Fully within a public right-of-way
- **Minimum Facility Width:** 10 feet, 12 feet preferred
- **Construction Material:** Concrete, brick or hardscape pavers
- **Joints:** Not applicable, but saw-cut is preferred for concrete sidewalks
- **Obstructions:** Street lights, street signs, planters, trees, public art, and seating may be located on the sidewalk as long as 5 feet of clear-way is maintained in all sections
- **Street Separation:** Not required

Typical Cross Section

See images in right column.

Design Priorities

- **Primary Priorities:**
 - Reinforcing commercial character
 - ADA compliance at intersections
 - Variation in construction materials
 - Street trees
- **Secondary Priorities:**
 - Unobstructed
 - Avoid steep slopes

Safety Enhancements

- Striped crosswalks
- Change in pavement material at corners
- Saw-cut joints
- Tree canopy trimmed to give at least 7 feet of clearance
- Lighting
- Tabled (raised) crosswalks



Redevelopment along West Main Street incorporates Urban Commercial Sidewalks.



The Urban Commercial Sidewalks in Clay Terrace are an integral part of the life-style center's design concept.

SIDE PATH

General Description

A Side Path is designed to accommodate the following type of bicycle and pedestrian activities along collector, parkway and arterial streets:

- walking
- jogging
- pushing strollers
- children recreation
- skating/blading
- slow to moderate speed cycling
- commuting
- riding Segways

Generally, Side Paths provide connectivity from neighborhood to neighborhood and linkages to community amenities (e.g. Parks and Neighborhood Service Nodes).

Facility Features

- **Right-of-Way:** Fully within a public right-of-way
- **Minimum Facility Width:** 10 feet
- **Construction Material:** Asphalt or saw-cut concrete
- **Joints:** Not applicable for asphalt, but concrete must have saw-cut joints
- **Obstructions:** None allowed
- **Street Separation:** Minimum of 8 feet

Typical Cross Section

See images in right column.

Design Priorities

- **Primary Priorities:**
 - Unobstructed
 - Use slight curves to avoid obstructions
 - Positive drainage away from Side Path
 - Placement on both sides of the street
 - ADA compliance at intersections
- **Secondary Priorities:**
 - Reinforcing local character
 - Avoid steep slopes

Safety Enhancements

- Striped crossings at streets and major curb cut intersections
- Signs for **bicycles**, pedestrians and automobiles at intersections
- Smooth transitions from Off-Street Trail to street surface at intersections
- Bollards or chicane gates at **bicycle or** pedestrian approaches to major streets or mid-block crossings.
- Lighting



Recent upgrades to 106th Street in Home Place include a Side Path link to the Monon Trail.



Side Paths were installed when Oak Ridge Road was transformed to a Residential Parkway.

ON-STREET BICYCLE LANE

General Description

An On-Street Bicycle Lane is designed to accommodate the following bicycle activities along existing roadways:

- commuting
- fitness cycling
- recreation cycling

Generally, On-Street Bicycle Lanes are intended to provide a safer facility for fast-moving bicycle traffic.

Facility Features

- **Right-of-Way:** Fully within a public right-of-way
- **Minimum Facility Width:** 6 feet
- **Construction Material:** Asphalt
- **Joints:** Not applicable
- **Obstructions:** None allowed
- **Street Separation:** By painted strip

Typical Cross Section

See images in right column.

Design Priorities

- **Primary Priorities:**
 - Lane definition
 - Information and traffic signs
 - Unobstructed
 - Placement on both sides of street
 - Positive drainage away from On-Street Bicycle Lane
- **Secondary Priorities:**
 - Lighting
 - Avoid steep slopes
 - Avoid unnecessary curvature of alignment

Safety Enhancements

- Striped lanes (**not raised markings**) at street intersections
- Smooth transitions from asphalt to curb
- Street sweep sand, stones and debris from bicycle lanes
- Lighting
- Storm water inlet orientation and product selection
- Separation between parallel parking and bicycle lanes
- Bicycle signals



East 116th Street east of Keystone Avenue was among the first streets in Carmel to have a designated bike lane.



On-Street Bicycle Lanes help ensure cyclist safety by defining limits for motorists.

OFF-STREET URBAN TRAIL

General Description

An Off-Street Urban Trail is designed to accommodate volumes of bicycle and pedestrian activities along highly traveled areas near City Center and Old Town.

Generally, Off-Street Urban Trails provide recreational, fitness and commuting opportunities in both urban and natural settings.

Facility Features

- **Right-of-Way:** May be in right-of-way, easement or public park
- **Minimum Facility Width:** 24 feet
- **Construction Material:** Asphalt, saw-cut concrete or other suitable surface
- **Joints:** Any concrete must have saw-cut joints
- **Obstructions:** None allowed
- **Street Separation:** Not applicable

Typical Cross Section

See images in right column.

Design Priorities

- **Primary Priorities:**
 - Unobstructed
 - Separate bicycle and pedestrian lanes
 - Minimize disturbance to sensitive natural features
 - Landscaping
 - Wayfinding signs
- **Secondary Priorities:**
 - User comforts such as plazas, benches, water fountains, and public art
 - ADA compliance at intersections
 - Avoid steep slopes

Safety Enhancements

- Striped crossings at street intersections
- Raised crossings at intersections
- Separated grade crossings
- Signs for trail users and automobiles at intersections
- Smooth transitions from Off-Street Trail to street surface at intersections
- Bollards or chicane gates at trail approaches to major streets or mid-block crossings
- Lighting at intersections



The Monon Trail passes through Old Town, providing pedestrians and cyclists access to this increasingly popular destination.

OFF-STREET TRAIL

General Description

An Off-Street Trail is designed to accommodate the following type of bicycle and pedestrian activities along natural or off-street corridors.

- walking
- jogging
- commuting
- pushing strollers
- children recreation
- skating/blading
- slow to moderate speed cycling
- riding Segways

Generally, Off-Street Trails provide recreation and fitness opportunities as well as a thoroughfare in natural settings.

Facility Features

- **Right-of-Way:** Not in right-of-way, but within an easement, floodplain or public park
- **Minimum Facility Width:** 16 feet total with a 12 foot wide trail and 2 foot shoulder.
- **Construction Material:** Asphalt, crushed limestone or other suitable surface
- **Joints:** Not applicable
- **Obstructions:** None allowed
- **Street Separation:** Not applicable

Typical Cross Section

See images in right column.

Design Priorities

- **Primary Priorities:**
 - Unobstructed
 - Minimize disturbance to sensitive natural features
 - Reflect natural character
 - Use curves to avoid obstructions
 - Positive drainage away from Off-Street Trail
- **Secondary Priorities:**
 - ADA compliance at intersections
 - Avoid steep slopes

Safety Enhancements

- Striped crossings at street intersections
- Signs for bicycles, pedestrians and automobiles at intersections
- Smooth transitions from Off-Street Trail to street surface at intersections
- Bollards or chicane gates at pedestrian approaches to major streets or mid-block crossings
- Grade-separated crossings
- Lighting at intersections



The Monon Trail provides access and contiguity between Carmel's and Indianapolis' trail systems.

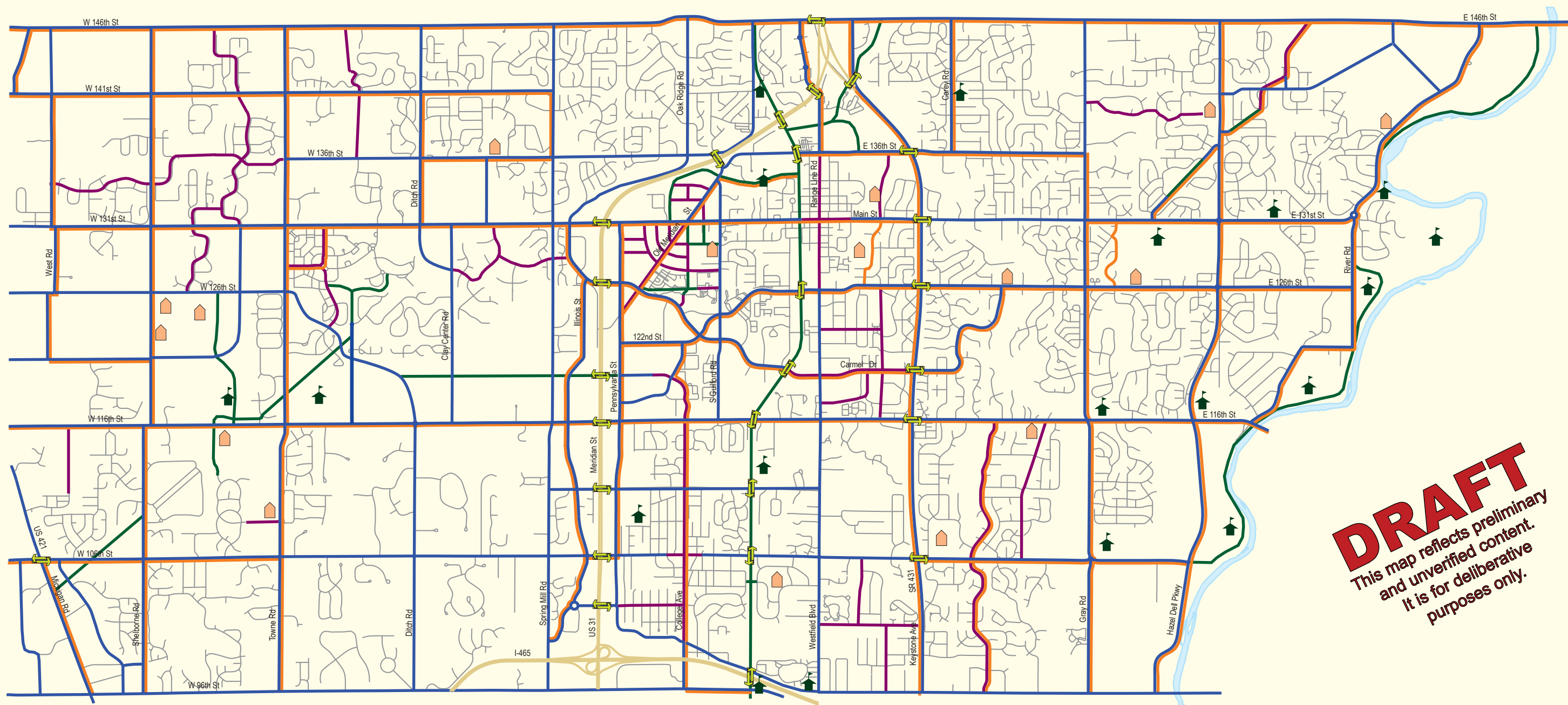


Off-Street Trails have been provided in several parks, like the one in West Park.

BICYCLE AND PEDESTRIAN PLAN MAP

The Bicycle and Pedestrian Plan Map (on page 71) applies the bicycle and pedestrian facility classifications throughout Carmel's planning jurisdiction. The bicycle and pedestrian facility classifications represent the future system, not what exists today.

Dashed lines are used to denote where new bicycle and pedestrian facilities are necessary to fulfill the *C3 Plan's* goals to mitigate traffic and improve quality of life. These new bicycle and pedestrian facilities should be viewed as mandatory when land is being developed adjacent to or inclusive of the new facility's proposed location.

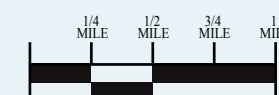


DRAFT
This map reflects preliminary
and unverified content.
It is for deliberative
purposes only.

MAP LEGEND

- | | |
|---------------------------|---|
| Off-Street Trail | Corridor without Bicycle or Pedestrian Facility |
| Bicycle Route or Facility | Grade-Separated Crossing |
| Side Path | School Location |
| Enhanced Sidewalk | Park Location |
| Sidewalk | River |

BICYCLE AND PEDESTRIAN PLAN MAP



Map Prepared by Ground Rules, Inc.

Last Revised 08-10-2006

Back Side of Bicycle and Pedestrian Plan Pull-Out

TRANSIT PLAN

The City is actively in pursuit of a means to convey commuters between key locations in Carmel, Hamilton County, and Indianapolis. The City also has interest in an intracity system to allow people to travel between key destinations in the City without using their own automobile. The primary purpose of these interests is to mitigate traffic on arterial streets and highways. The accomplishment of a regional commuter line and intracity system would also help nurture the integrity of the natural environment by reducing emissions and consumption of petroleum products.

It is suggested that a commuter line can not only mitigate traffic congestion, but can reduce commute times to downtown. ~~Also, commuters can utilize their time in-transit to read, make calls, or accomplish other productive tasks as they do in other cities.~~ Collectively, these benefits are expected to make a commuter line an attractive option for those who work in downtown Indianapolis but live in Carmel or vice versa.

A secondary purpose for a commuter line and intracity system is to provide accessibility to disabled persons, youth, seniors, and others who cannot or do not wish to drive.

Transit Facility Classifications and Descriptions

The following transit classifications are used on the Transit Plan Map:

- | | |
|-----------------------------------|-------|
| 1. Commuter Line | pg 74 |
| 2. Intracity Transportation | pg 75 |

Each of the transit facility classifications listed above has a page dedicated to describing how it can be used to mitigate traffic and how it fits into the fabric of the City. Further, the following headings are used, as described below, to convey the essence of each transit facility classification:

General Description: This section gives the reader a brief description of why the transit classification has been established.

Design Priorities: This section conveys the primary design standards that should apply to each type of transit to make it successful.

COMMUTER LINE

General Description

A Commuter Line would be designed to carry a large number of people from key locations in Carmel to one or more destinations in downtown Indianapolis. Additional stops en route to downtown Indianapolis may also be necessary. Most likely, this system would be a street-separated system.

An interim express bus system should be implemented to mitigate traffic and to begin building familiarity with commuter systems.

Currently the type of commuter line (e.g. raised monorail or light rail) has not been conceptualized, nor has any engineering or comprehensive study been conducted to choose a route. Extensive study should be conducted to determine an exact route, station locations, scheduling, ridership, cost, phasing, ties to other alternative transportation, and type of automated “vehicle” to use. For that reason this section is primarily a placeholder for revisions and additions as further study is conducted. Everything contained in this section should be considered conceptual and preliminary.

Design Priorities

- Commuter stops should take the form of “stations”.
- Stations in Carmel should be located in areas with intense employment and large parking capacity, or dense populations living within walking distance.
- Destinations for commuters to include Keystone at the Crossing and downtown Indianapolis.
- “Express” commute time to downtown Indianapolis.
- Automated operation.



MetroLink in St. Louis is an example of light rail. The electric powered system uses overhead power lines for energy.



The Clarian People Mover was recently installed in Indianapolis to better link hospital campuses to one another. This system represents an automated and raised rail system.



The Indianapolis Metropolitan Planning Office uses the above image to describe an at-grade automated rail system. The location of the system is unknown.

INTRACITY TRANSPORTATION SYSTEM

General Description

A Intracity Transportation System would be designed to carry a moderate number of people between key locations in Carmel. Additional routes may include key locations in Zionsville, Noblesville, Indianapolis, Westfield and/or Fishers. Most likely, this system would be a driver-operated, on-street system.

Currently the type of Intracity Transportation System (e.g. trolley or bus) has not been conceptualized, nor has any comprehensive study been conducted to determine an on-street system of routes and stops. Extensive study should be conducted to determine potential routes, stops, scheduling, ridership, cost, phasing, ties to other alternative transportation, and type of vehicles. For that reason this section is primarily a placeholder for revisions and additions as further study is conducted. Everything contained in this section should be considered conceptual and preliminary.

Design Priorities

- Intracity stops should take the form of “turnouts” to provide safe ingress and egress from the vehicle.
- Turnouts in Carmel should be located at popular destinations like Old Town, City Center, Clay Terrace, U.S. 31 office parks, Merchants’ Square, Central Park, and strategic locations near higher density residential developments.
- Convenience of schedule and efficiency in time.
- User-friendly and predictable.
- Driver operated.



The New Flyer brand hybrid electric bus represents the latest technology in low floor (for easy in and out) and low emission transit vehicles. Buses like this could match Carmel’s commitment to a fleet of fuel efficient and low emissions vehicles.



Some communities desire themed buses so riders can quickly recognize them and to fit better into the context. This is a trolley bus used in Central Park in New York City.



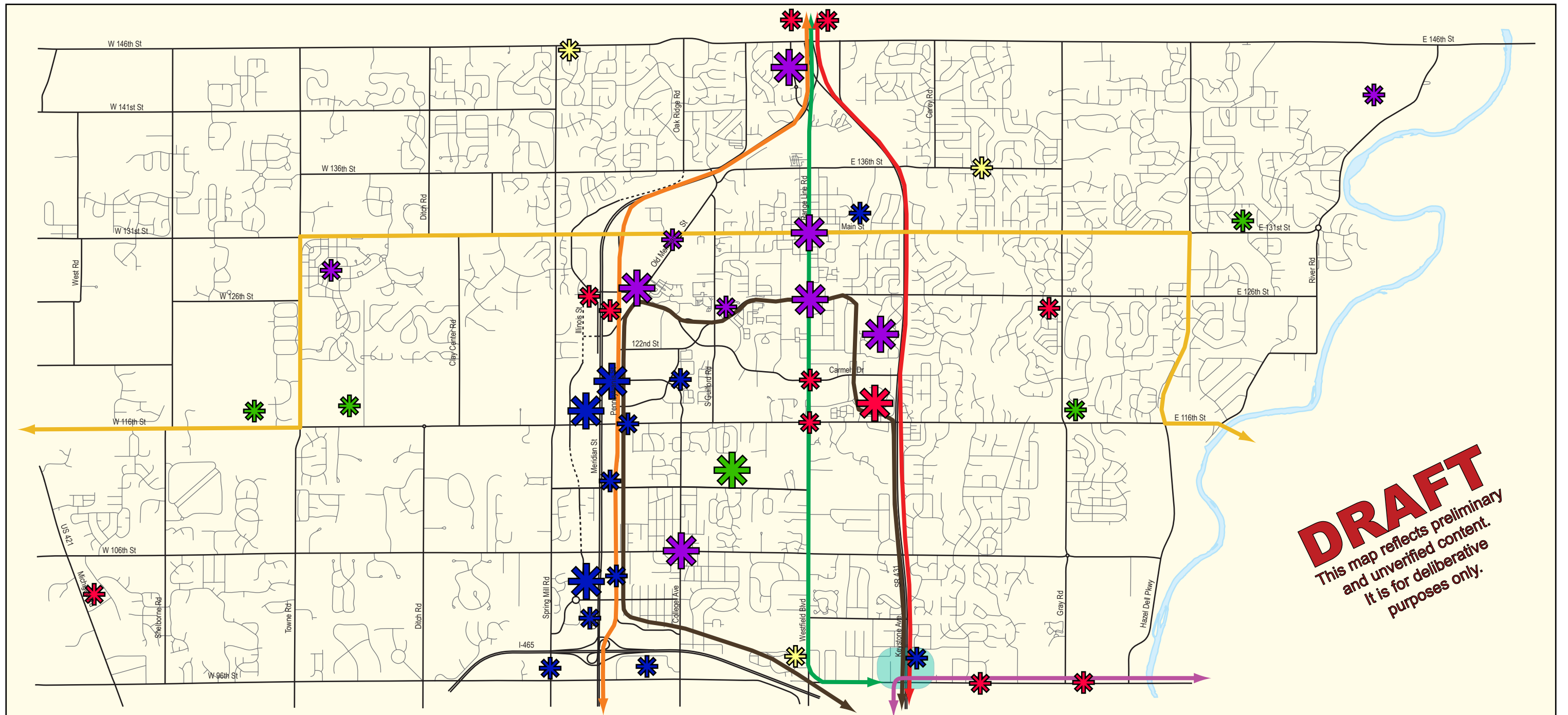
Traditional buses, like this one used in Austin, Texas, provide a lower up-front cost and have predictable maintenance and operation costs.

TRANSIT FACILITY PLAN MAP

The Transit Facility Plan Map (on the following page) conceptually demonstrates what a transit plan might look like if applied throughout Carmel’s planning jurisdiction. This map does not represent any engineered plan or the result of comprehensive study. It only depicts: (1) logical and potential destinations for an intracity bus (or similar) system and (2) a rough depiction of four optional routes for a commuter line to be integrated into Carmel. Exact routes and alignments will take extensive further study of the physical conditions, logistics, costs, and potential ridership.

The Transit Facility Plan Map is mostly a placeholder for a future map to be prepared through significant study. The second purpose is to instigate conversation about potential routes, stations and alignments; and to function as a reminder to City leaders and staff, street engineers, and developers to be sensitive to future transit needs.

It is the hope of this plan map to encourage new buildings to be built with expectation of a future transit system. It is also the hope that all street improvements along potential commuter routes be done to help facilitate a line from Carmel to downtown Indianapolis.

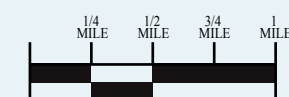


DRAFT
This map reflects preliminary
and unverified content.
It is for deliberative
purposes only.

MAP LEGEND

- | | | | | | | | |
|--|--------------------------|--|--------------------------------|--|---|--|--------------|
| | Major Intra-City Stop | | Retail/Commercial Node | | Keystone Corridor Line (Conceptual) | | Major Street |
| | Minor Intra-City Stop | | Employment/Office/Medical Node | | Carmel Core Line (Conceptual) | | Minor Street |
| | Transit Hub (Conceptual) | | Mixed-Use Node | | Range Line Road Line (Conceptual) | | River |
| | | | Residential Node | | Pennsylvania Street Line (Conceptual) | | |
| | | | Parks Node | | Cross-County Line (Conceptual) | | |
| | | | | | Fishers to Indianapolis Line (Conceptual) | | |

TRANSIT PLAN MAP



Map Prepared by Ground Rules, Inc.

Last Revised 08-10-2006

Back Side of Transit Facility Plan Pull-Out